User Manual

Connection to DeviceNet

Part Number:	80 860.642
Version:	1
Date:	12.07.2005
Valid for:	TSwin .net 4.0x

SÜTRON ELECTRONIC GMBH

Version	Date	Modifications
1	12.07.2005	First edition

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Overall Table of Contents

1 DeviceNet 1-1

1.1 Explicit Message 1-1
1.1.1 Storing Data 1-1
1.1.2 Exchanging Data 1-1
1.1.3 Data Memory 1-2
1.1.4 Read Service 1-2
1.1.5 Write Service 1-3
1.1.6 Fragmentation 1-4
1.2 Poll I/O Connection 1-4
1.2.1 Receive Data of the Operating Device (Consumed Data) 1-4
1.2.2 Transmit Data of the Operating Device (Produced Data) 1-4
1.2.2.1 Byte 1 - Initialization 1-5
1.2.2.2 Byte 2 - Control Byte 1-5
1.2.2.3 Byte 3 and Byte 4 - Word Address 1-5
1.2.2.4 Byte 5 - Number of Bytes 1-6
1.2.3 Module/Network Status 1-6
1.3 Programming 1-6
1.3.1 Protocol Parameters 1-6
1.3.1.1 Baud Rate 1-6
1.3.1.2 Node Number 1-6
1.3.1.3 Delay until Connection Set-Up 1-7
1.3.1.4 Waiting Time for Response 1-7
1.3.1.5 Attribute 1-7
1.3.1.6 Byte Order 1-7
1.3.2 Input Syntax 1-9
1.3.3 Variables 1-9
1.3.4 System Variables 1-9
1.3.4.1 ComBaudrateA 1-9
1.3.4.2 ComHandshakeA 1-10
1.4 Object Definitions 1-10
1.4.1 Identity Object 1-10
1.4.1.1 Class Attribute of Identity Object 1-10
1.4.1.2 Instance Attribute of the Identity Object 1-10
1.4.1.3 Instance Service of the Identity Object 1-11
1.4.1.4 Message Router Object 1-11
1.4.2 DeviceNet Object 1-11
1.4.2.1 Class Attribute of the DeviceNet Object 1-11
1.4.2.2 Instance Attribute of the DeviceNet Object 1-11
1.4.2.3 Instance Service of the DeviceNet Object 1-11
1.4.3 Assembly Object 1-12
1.4.3.1 Class Attribute of the Assembly Object 1-12
1.4.3.2 Instance 1 Attribute - Static Input - of the Assembly Object 1-12
1.4.3.3 Instance 2 Attribute - Static Output - of the Assembly Object 1-12
1.4.4 Connection Object 1-12
1.4.4.1 Class Attribute of the Connection Object 1-12
1.4.4.2 Instance Attribute of the Connection Object 1-12

1.4.4.3 Instance Service of the Connection Object 1-13
1.4.5 BT Object 1-13
1.4.5.1 Instance Service of the BT Object 1-13
1.5 Format of the Explicit Message 1-16
1.6 EDS File 1-18
1.7 Physical Interfacing 1-18
1.7.1 DeviceNet, 9 Pin D-SUB 1-18
1.7.1.1 Pin Assignment 1-19
1.7.2 DeviceNet, 5 Pin Male Connector Strip 1-19
1.7.2.1 Pin Assignment 1-20
1.7.3 Cable DeviceNet, 9 Pin D-SUB 1-22
1.7.4 Cable DeviceNet, 5 Pin Male Connector Strip 1-22
1.8 Error Messages 1-23
1.9 Applications 1-24
1.9.1 OMRON DRM 21-V1 1-24
1.9.2 Rexroth PPC 1-24
1.9.3 Rockwell RS Logix 5555 - 1756 DNB 1-25
1.9.4 Rockwell SLC 505 - 1747 SDN/B 1-25

A Index A-1

1 DeviceNet

The operating device is incorporated into the DeviceNet network as a DeviceNet slave. The communication between a controller (master or scanner) and the operating device (slave) is based on the Predefined Master/Slave Connection Set.

Explicit Message Connections and Poll I/O Connections are used as Connection Instances.

1.1 Explicit Message

Explicit Messages are used to exchange data between the operating device and the controller. This requires you to create a function block in the controller which assembles the payload into Explicit Messages.

1.1.1 Storing Data

All data displayed by the operating device are stored in the operating device's data memory.

The size of the data memory is 2500 words.

The data memory is word-oriented. The addresses are always word addresses, both from the operating device's and the controller's perspective.

1.1.2 Exchanging Data

You need to create a program (function block) in the controller which is used to establish a data exchange between the operating device and the controller by means of Explicit Messages. For this, make sure that the data on both devices are consistent.

New data in the controller has to be transferred to the operating device by **Explicit Messages**. The controller is informed about new data in the operating device by **I/O Poll Telegram**. The controller has to read the data from the operating device by **Explicit Message**.

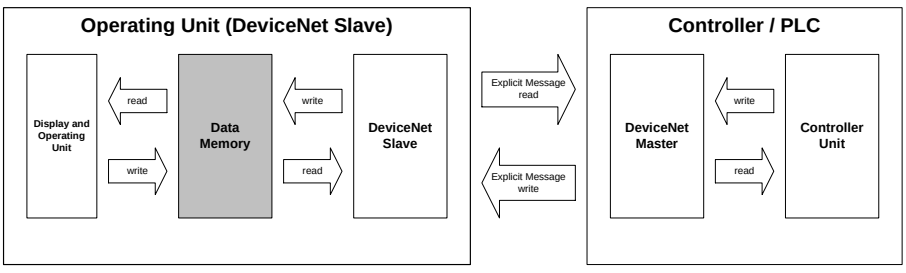


Figure 1-1 Data exchange, DeviceNet

1.1.3 Data Memory

The data memory in the operating device is referred to as the Memory Object.

The Memory Object Address has the following values.

Table 1-1 Memory object addresses

Address	Name	Comment
0x8A	Class ID	
0x01	Instance ID	
0x01	Attribute	Not Required

The service

– for a read access is 0x33 and
– for a write access is 0x35.

1.1.4 Read Service

The following table illustrates the structure of the Explicit Message for the Read service. Each field of the telegram is one byte long.

Table 1-2 Structure of the Explicit Message for the Read service

Byte	Request Telegram	Response Telegram
1	MAC ID	MAC ID
2	Service ID 0x33	Service ID 0xB3
3	Class ID 0x8A	1st Data Word Low Byte
4	Instance ID 0x01	1st Data Word High Byte
5	Word Address Low Byte	2nd Data Word Low Byte
6	Word Address High Byte	2nd Data Word High Byte
7	Number of Bytes Low Byte	
8	Number of Bytes High Byte	

The word address corresponds to the offset within the data memory in the operating device.

The byte order for the

– word address,
– number of bytes and
– data word

can be specified in the communication parameters.

See chapter “Byte Order“ on page 1-7.

1.1.5 Write Service

The following table illustrates the structure of the Explicit Message for the Write service. Each field of the telegram is one byte long.

Table 1-3 Structure of the Explicit Message for the Write service

Byte	Request Telegram	Response Telegram
1	MAC ID	MAC ID
2	Service ID 0x35	Service ID 0xB5
3	Class ID 0x8A	
4	Instance ID 0x01	
5	Word Address Low Byte	
6	Word Address High Byte	
7	1st Data Word Low Byte	
8	1st Data Word High Byte	
9	2nd Data Word Low Byte	
10	2nd Data Word High Byte	

The word address corresponds to the offset within the data memory in the operating device.

The byte order for the
– word address,
– number of bytes and
– data word

can be specified in the communication parameters.

See chapter “Byte Order“ on page 1-7.

1.1.6 Fragmentation

By means of fragmentation, up to 384 bytes can be transferred in one explicit message.

1.2 Poll I/O Connection

On account of the EDS data, the Poll I/O Connection is installed automatically between the DeviceNet master and the operating device. With this connection, 2 bytes are transferred cyclically from the controller’s OUT area to the operating device and 5 bytes are transferred from the operating device to the IN area of the controller.

1.2.1 Receive Data of the Operating Device (Consumed Data)

The Consumed Connection Size is 2 bytes.

Table 1-4 Structure of the Consumed Data

Byte	Designation
1	Initialization
2	Control Byte

1.2.2 Transmit Data of the Operating Device (Produced Data)

The Produced Connection size is 5 bytes.

Table 1-5 Structure of the Produced Data

Byte	Designation
1	Initialization
2	Control Byte
3	Word Address - Low Byte
4	Word Address - High Byte
5	Number of Altered Bytes

1.2.2.1 Byte 1 - Initialization

During the boot process, the operating device writes the value 0x00 into its Produced Data. Thus, the controller needs to initialize the entire data memory in the operating device once.

Initialization means that all variable values in the data memory of the operating device are set the same as in the controller. When this process is completed, the controller writes the value 0xC3 into the Consumed Data.

The operating device acknowledges by writing the value 0xC3 into the Produced Data.

After the boot process, the operating device waits for the initialization to complete, before it accesses the data memory. If the initialization is not performed within the time period set for the Delay until Connection Setup, the following message appears.

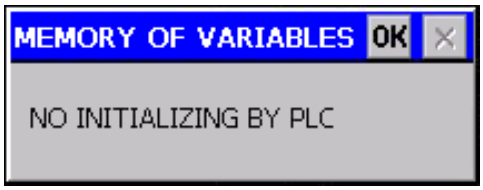


Figure 1-2 Message NO INITIALIZATION BY PLC

To remove the message, press **OK**, the **Help** key or a key that calls up another screen.

1.2.2.2 Byte 2 - Control Byte

During initialization, the control byte is set to the value 0x00.

Bit 0:

Bit 0 is the toggle bit.

After you change a variable on the operating device, bit 0 in the Produced Data toggles.

If the controller detects that bit 0 in the Produced Data and bit 0 in the Consumed Data do not match, the conroller has to read the changed data of the variable by „Explicit Message“.

Once the read operation is complete, the controller sets the value of bit 0 in the Consumed Data to the same value as that of bit 0 in the Produced Data.

If the controller detects that bit 0 in the Produced Data and bit 0 in the Consumed Data differ, bit 0 in the Consumed Data must be set to the same value as that of bit 0 in the Produced Data!

If no bit synchronization takes place, the operating device displays the error message Timeout Error: Code 60, Subcode1“.

Bit 1 to bit 7

Bits 1 to 7 are reserved.

1.2.2.3 Byte 3 and Byte 4 - Word Address

Bytes 3 and 4 in the Produced Data contain the word address starting from which a variable has changed. The variable can be several bytes long. The controller uses this word address to selectively read the changed variable from the data memory of the operating device.

1.2.2.4 Byte 5 - Number of Bytes

Byte 5 in the Produced Data contains the number of bytes as the size information for the changed variable.

1.2.3 Module/Network Status

The operating devices are not equipped with diagnostic LEDs for DeviceNet status indication.

To indicate the module/network status, use the system variable **ComBaudrateA** instead.

See chapter “ComBaudrateA“ on page 1-9.

1.3 Programming

1.3.1 Protocol Parameters

With the protocol parameters, you can adapt the communication of the controller used.

1.3.1.1 Baud Rate

This parameter specifies the communication rate.

Table 1-6 Baud rate

Configurable Values (kBaud)	Default Value
125	X
250	
500	

1.3.1.2 Node Number

Use the node number to set the MAC ID for the operating device.

Table 1-7 Node number

Configurable Values	Default Value
0 to 63	0

1.3.1.3 Delay until Connection Set-Up

Specify this value to set the period of time the operating device waits before it sends the first Duplicate MAC ID Check Request Message. Messages arriving before this time has elapsed are not evaluated.

Table 1-8 Delay until connection set-up

Configurable Values	Default Value
5 s to 255 s	5 s

1.3.1.4 Waiting Time for Response

Specify a waiting time for the Produced Data toggle bit monitoring.

Table 1-9 Waiting time for response

Configurable Values	Default Value
0 ms, 50 ms to 65000 ms	500 ms

See chapter “Byte 2 - Control Byte“ on page 1-5.

1.3.1.5 Attribute

The Attribute parameter is not required in the Explicit Message to access the Memory Object. Some controllers do, however, force and transfer the Attribute parameter to generate an Explicit Message.

In this case, select the check box: Explicit Message Contains the Parameter 'Attribute'.

Table 1-10 Explicit Message contains the Attribute parameter

Configurable Values	Default Value
OFF	
ON	X

1.3.1.6 Byte Order

The byte order for the DeviceNet protocol is Low-High.

See Appendix J in Volume 1 of the DeviceNet Specification.

The experience of some users has shown that some controllers do not use this byte order. In these cases, a byte-swap must be performed in the controller. For ease of programming, the user also has the option of swapping the byte order in the operating device.

Select two selection fields depending on the actual byte order:

Table 1-11 Byte order

Configurable Values	Default Value
Address/Length Low-High	X
Data Low-High	X
Address/Length High-Low	
Data High-Low	

1.3.2 Input Syntax

The following image illustrates the structure of the input syntax for variables in the programming software.

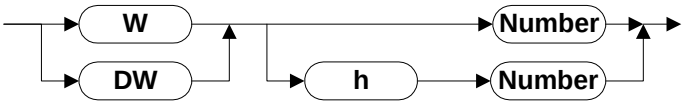


Figure 1-3 Syntax diagram

1.3.3 Variables

The variable addresses specify an offset in the data memory of the operating device.

Table 1-12 Addresses in the data memory of the operating device

Variable Name	Address	Low Byte	High Byte
Word Access to Address 127	W 127		
Word Access to the Highest Address	W 2500		
Double-Word Access to Address 371	DW 371		
Double-Word Access to the Highest Address	DW 2499		
Bit Access to Bit 5 in Address 500	W 500	5	5
Bit Field Access to Bit 3 - Bit 12 in Address 1500	W 1500	3	12

1.3.4 System Variables

Since the operating devices do not have diagnostic LEDs, you need to use system variables to indicate specific DeviceNet statuses. You can create these system variables within any screen as output variables. To do so, select the representation type Selection Text and link the variable with a text list containing a text string for each status.

1.3.4.1 ComBaudrateA

This system variable can be used to indicate the statuses of the module/network LED.

Table 1-13 Statuses of the module/network LED

Value	Text	Meaning
0	LED Off	
1	LED Green	Device is Assigned
2	LED Flashes Green	DUP_MAC_ID Test is Okay But a Connection is Not Established
3	LED Flashes Red	Connection Terminated After a Time Delay
4	LED Red	BUS-OFF Status
5	LED Flashes Red And Green	DUP_MAC_ID Error

1.3.4.2 ComHandshakeA

This system variable allows you to indicate whether the data memory has been initialized by the master.

See chapter “Byte 1 - Initialization“ on page 1-5.

Table 1-14 Initialization states of the data memory

Value	Status
0	Not initialized
1	Initialized

1.4 Object Definitions

Table 1-15 Object definitions

Class ID	Object Name
0x01	Identity Object
0x02	Message Router (Not Supported)
0x03	DeviceNet Object
0x04	Assembly Object (Not Supported)
0x05	Connection Object
0x8A	BT Object

1.4.1 Identity Object

1.4.1.1 Class Attribute of Identity Object

Table 1-16 Class Attribute of Identity Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	Revision	Get	2 (6-2.2)	0x01

1.4.1.2 Instance Attribute of the Identity Object

Table 1-17 Instance Attribute of the Identity Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	Vendor ID	Get	2 (6-2.2)	0x238
0x02	Device Type	Get	2	0x00
0x03	Product Code	Get	2	0x01
0x04	Revision	Get	2	0x0101 (1.001)

Table 1-17 Instance Attribute of the Identity Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x05	Status	Get	2	
0x06	Serial Number	Get	4	0x01
0x07	Product Name	Get	32	DeviceNet For BT Series

1.4.1.3 Instance Service of the Identity Object

Table 1-18 Instance Service of the Identity Object

Service ID	Service Name	Description
0x0E	Get_Attribute_Single	Returns the Contents of the Specific Attribute
0x05	Reset	Invoke the Reset Service in the BT

1.4.1.4 Message Router Object

This object is not supported.

1.4.2 DeviceNet Object

1.4.2.1 Class Attribute of the DeviceNet Object

Table 1-19 Class Attribute of the DeviceNet Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	Revision ID	Get	1 (5-5.3)	0x02

1.4.2.2 Instance Attribute of the DeviceNet Object

Table 1-20 Instance Attribute of the DeviceNet Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	MAC ID	Get	1 (5-5.3)	
0x02	BaudRate	Get	1 (5-5.3)	
0x05	Allocation Information	Get	1 (5-5.3)	

1.4.2.3 Instance Service of the DeviceNet Object

Table 1-21 Instance Service of the DeviceNet Object

Service ID	Service Name	Description
0x0E	Get_Attribute_Single	Read attribute
0x4B	Allocation Master/Slave Connection Set	Request to use predefined master/slave connection set
0x4C	Release Group 2 Identifier Set	Release desired connection

1.4.3 Assembly Object

1.4.3.1 Class Attribute of the Assembly Object

Table 1-22 Class Attribute of the Assembly Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	Revision	Get	1	0x02

1.4.3.2 Instance 1 Attribute - Static Input - of the Assembly Object

Table 1-23 Instance 1 Attribute - Static Input - of the Assembly Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x03	Set Data	Get	5	

1.4.3.3 Instance 2 Attribute - Static Output - of the Assembly Object

Table 1-24 Instance 2 Attribute - Static Output - of the Assembly Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x03	Set Data	Get	2	

1.4.4 Connection Object

1.4.4.1 Class Attribute of the Connection Object

Table 1-25 Class Attribute of the Connection Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Attribute Value
0x01	Revision	Get	1	0x01

1.4.4.2 Instance Attribute of the Connection Object

Table 1-26 Instance Attribute of the Connection Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Value Expl.	Value IO-Poll
0x01	State	Get	1		
0x02	Instance Type	Get	1	0	1
0x03	TransportClass_Trigger	Get	1	0x38	0x82
0x04	Produced Connection ID	Get	2		
0x05	Consumer Connection ID	Get	2		
0x06	Initial Comm Characteristics	Get	1	0x21	0x01
0x07	Produced Connection Size	Get	2	0xFFFF	5
0x08	Consumed Connection Size	Get	2	0xFFFF	2
0x09	Expected Packed Rate	Get/Set	2	Default	Default
0x0C	Watchdog Timeout Action	Get/Set	1	Default	Default
0x0D	Produced Connection Path Length	Get	2	0	6

Table 1-26 Instance Attribute of the Connection Object

Attribute ID	Attribute Name	Access Rule	Data Size (Byte)	Value Expl.	Value IO-Poll
0x0E	Produced Connection Length	Get	6	0	20 04 24 01 30 03
0x0F	Consumed Connection Path Length	Get	2	0	6
0x10	Consumed Connection Path	Get	6	0	20 04 24 02 30 03

1.4.4.3 Instance Service of the Connection Object

Table 1-27 Instance Service of the Connection Object

Service ID	Service Name	Description
0x0E	Get_Attribute_Single	Read Attribute
0x10	Set_Attribute_Single	Write Attribute

1.4.5 BT Object

1.4.5.1 Instance Service of the BT Object

Table 1-28 Instance Service of the BT Object

Service ID	Service Name	Description
0x33	Block StringN Read	Read Data by Each Data Unit
0x35	Block StringN Write	Write Data by Each Data Unit

Service ID = 0x33 (Block StringN Read)

Table 1-29 Request without Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0x33)
3	Class ID (0x8A)
4	Instance ID (0x01)
5	Word Address Low Byte *
6	Word Address High Byte *
7	Word Number of Bytes Low Byte *
8	Word Number of Bytes High Byte *

Table 1-30 Response without Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0xB3)
3	1st Data Word Low Byte **

Table 1-30 Response without Attribute parameter

Byte	Designation
4	1st Data Word High Byte **
5	2nd Data Word Low Byte **
6	2nd Data Word High Byte **

Table 1-31 Request with Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0x33)
3	Class ID (0x8A)
4	Instance ID (0x01)
5	Attribute (0x01)
6	Word Address Low Byte *
7	Word Address High Byte *
8	Word Number of Bytes Low Byte *
9	Word Number of Bytes High Byte *

Table 1-32 Response with Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0xB3)
3	1st Data Word Low Byte **
4	1st Data Word High Byte **
5	2nd Data Word Low Byte **
6	2nd Data Word High Byte **

Service ID = 0x35 (Block StringN Write)

Table 1-33 Request without Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0x35)
3	Class ID (0x8A)
4	Instance ID (0x01)
5	Word Address Low Byte *
6	Word Address High Byte *
7	1st Data Word Low Byte **

Table 1-33 Request without Attribute parameter

Byte	Designation
8	1st Data Word High Byte **
9	2nd Data Word Low Byte **
10	2nd Data Word High Byte **

Table 1-34 Response without Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0xB5)

Table 1-35 Request with Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0x35)
3	Class ID (0x8A)
4	Instance ID (0x01)
5	Attribute (0x01)
6	Word Address Low Byte *
7	Word Address High Byte *
8	1st Data Word Low Byte **
9	1st Data Word High Byte **
10	2nd Data Word Low Byte **
11	2nd Data Word High Byte **

Table 1-36 Response with Attribute parameter

Byte	Designation
1	MAC ID
2	Service ID (0xB5)

* Depends on the protocol parameter Byte Order for Address/Length.

** Depends on the protocol parameter Byte Order for Data.

1.5 Format of the Explicit Message

Table 1-37 Format of the Explicit Message

Class ID (1 Byte)	Service ID (1 Byte)	Instance ID (1 Byte)	Service Data		Service Name
			Attribute ID (1 Byte)	Data (n Byte)	
0x01 (Identity Object)	0x0E (Get)	0x01	0x01	Vendor ID	Get Attribute Single Vendor ID
			0x02	Product Type	Get Attribute Single Product Type
			0x03	Product Code	Get Attribute Single Product Code
			0x04	Vendor Revision	Get Attribute Single Vendor Revision
			0x05	ID Status	Get Attribute Single ID Status
			0x06	Serial Number	Get Attribute Single Serial Number
			0x07	Product Name	Get Attribute Single Product Name
	0x05	0x01	N/A or 0x01		RESET
0x03 (Device-Net Object)	0x0E (Get)	0x01	0x01	MAC ID	Get Attribute Single MAC ID
			0x02	Baud Rate	Get Attribute Single Baud Rate
			0x05	Allocation Information	Get Attribute Single Allocation Information
0x04 (Assembly Object)	0x0E (Get)	0x64	IN DATA		IN DATA
	0x0E (Get)	0x65	OUT DATA		OUT DATA

Table 1-37 Format of the Explicit Message

Class ID (1 Byte)	Service ID (1 Byte)	Instance ID (1 Byte)	Service Data		Service Name
			Attribute ID (1 Byte)	Data (n Byte)	
0x05 (Connection Object)	0x0E (Get)	0x01 (Explicit Message) 0x02 (Polled I/O)	0x01	State	Get Attribute Single State
			0x02	Instance Type	Get Attribute Single Instance Type
			0x03	Transport Class Trigger	Get Attribute Single Transport Class Trigger
			0x04	Produced Connection ID	Get Attribute Single Produced Connection ID
			0x05	Consumed Connection ID	Get Attribute Single Consumed Connection ID
			0x06	Initial Comm. Characteristics	Get Attribute Single Initial Comm. Characteristics
			0x07	Produced Connection Size	Get Attribute Single Produced Connection Size
			0x08	Consumed Connection Size	Get Attribute Single Consumed Connection Size
			0x09	Expected Packet Rate	Get Attribute Single Packet Rate
			0x0C	Watchdog Timeout Action	Get Attribute Single Watchdog Timeout Action
			0x0D	Produced Connection Path Length	Get Attribute Single Produced Connection Path Length
			0x0E	Produced Connection Path	Get Attribute Single Produced Connection Path
			0x0F	Consumed Connection Path Length	Get Attribute Single Consumed Connection Path Length
			0x10	Consumed Connection Path	Get Attribute Single Consumed Connection Path
0x8A (PT Object)	0x33	0x1	Service Data		Block String Read
	0x35	0x1	Service Data		Block String Write
	0x33	0x1	0x0	Data	Block String Read *
	0x35	0x1	0x0	Data	Block String Write *

* Alternative, depends on the communication parameter **Attribute**.

1.6 EDS File

The EDS file ensures that the Poll I/O Connection is automatically installed between the DeviceNet master and operating device.

1.7 Physical Interfacing

1.7.1 DeviceNet, 9 Pin D-SUB

The connectors on the operating device and the cable connectors for the connection to the DeviceNet bus must comply with the DeviceNet connector profile.

Table 1-38 D-SUB connector profile for DeviceNet

Parameter	Specification
Male Connector Strip (X2.1)	
Number of Pins	9
Tension Nut	None
Rotation	None
Standards	D-SUB DIN41652 / CECC 75301-802
Contact Assignment	CAN_H = 7 CAN_L = 2 DRAIN = Housing
Male Connector Strip (X2.2)	
Number of Female Connectors	9
Tension Nut	None
Rotation	None
Standards	D-SUB DIN41652 / CECC 75301-802
Contact Assignment	CAN_H = 7 CAN_L = 2 DRAIN = Housing
Physical Properties	
Contact Surface	Gold-plated Copper-alloy or Gold-plated Palladium-Nickel
Lifetime of Contacts	>500 Plug-in Cycles
Electrical Properties	
Operating Voltage	>25 V
Current Carrying Capacity	>5 A
Contact Resistance	Nominal = <10 mOhm Maximum = 20 mOhm IEC 60512 Test 2A Millivolt Level Method
Ambient Conditions	

Table 1-38 D-SUB connector profile for DeviceNet

Parameter	Specification
Water Resistance	No Information Provided
Oil Resistance	No Information Provided
Ambient Temperature Operation	–55 °C to +105 °C
Ambient Temperature Storage	–55 °C to +105 °C

1.7.1.1 Pin Assignment

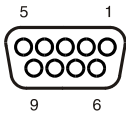


Figure 1-4 9 pin D-SUB female connector strip

Connector in the terminal: 9 pin D-SUB female connector strip.

Table 1-39 Pin assignment CAN

Pin	Designation	Function
1	nc	Not Connected
2	CAN_L	CAN_L Bus Line (Dominant LOW)
3	CAN_GND	CAN Ground
4	nc	Not Connected
5	nc	Not Connected
6	CAN_GND	CAN Ground
7	CAN_H	CAN_H Bus Line (Dominant HIGH)
8	nc	Not Connected
9	nc	Not Connected

1.7.2 DeviceNet, 5 Pin Male Connector Strip

The connectors on the operating device and the cable connectors for the connection to the DeviceNet bus must comply with the DeviceNet connector profile.

Table 1-40 5 pin male connector strip profile for DeviceNet

Parameter	Specification
Male Connector Strip	
Number of Pins	5
Tension Nut	None
Rotation	None
Standards	Figure on Inquiry

Table 1-40 5 pin male connector strip profile for DeviceNet

Parameter	Specification
Contact Assignment	nc = 1 (Not Connected) CAN_L = 2 Drain = 3 CAN_H = 4 nc = 5 (Not Connected)
Female Connector Strip	
Number of Pins	5
Tension Nut	None
Rotation	None
Standards	Figure on Inquiry
Contact Assignment	nc = 1 (Not Connected) CAN_L = 2 Drain = 3 CAN_H = 4 nc = 5 (Not Connected)
Physical Properties	
Contact Surface	30 Micro Inch Gold Minimum Over 50 Micro Inch Nickel Minimum or 5 Micro Inch Gold Minimim Over 20 Micro Inch Palladium-Nickel Minimum Over 50 Micro Inch Nickel, All Gold Must be 24 Karat
Lifetime of Contacts	100 Insertion-Extractions
Electrical Properties	
Operating Voltage	25 Volt Minimum
Current Carrying Capacity	8 Ampere Minimum
Contact Resistance	Nominal: Less than 1 mOhm Maximum: 5 mOhm Over Life
Ambient Conditions	
Water Resistance	None
Oil Resistance	Nne
Ambient Temperature Operation	–40 °C to +70 °C Full Power With Linear Derating to 0 Ampere at 80 °C
Ambient Temperature Storage	–40 °C to +85 °C

1.7.2.1 Pin Assignment

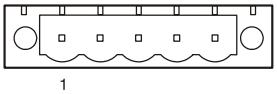


Figure 1-5 5 pin connector

Connector in the operating terminal: 5 pin male connector strip.

Table 1-41 Pin assignment CAN

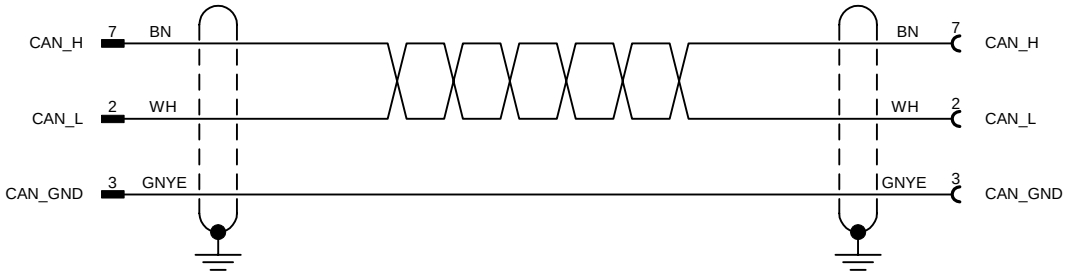
Pin	Designation	Function
1	nc	Not Connected
2	CAN_L	CAN_L Bus Line (Dominant LOW)
3	Drain	Shield
4	CAN_H	CAN_H Bus Line (Dominant HIGH)
5	nc	Not Connected

For the connection, use a 5 pin connector with gold-plated contacts. A suitable connector can be obtained directly from Sütron electronic.

1.7.3 Cable DeviceNet, 9 Pin D-SUB

Operating device

Next DeviceNet participant



D-SUB male connector 9 pin

D-SUB female connector 9 pin

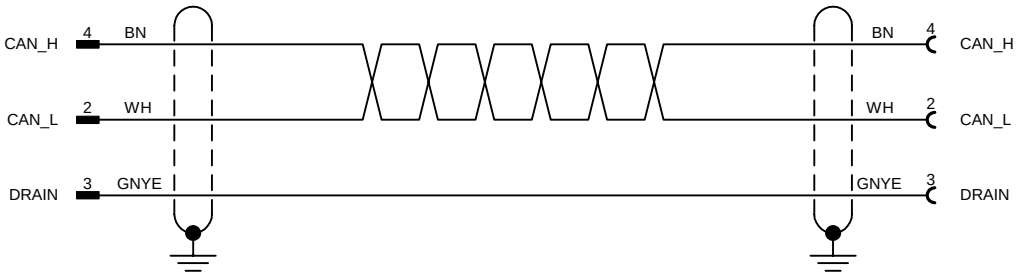
Both ends of the shield are connected to the metallic housing.

Contrary to the recommendations made in the CiA Draft Standard 102, the cable is only equipped with the wires needed to meet the current communication requirements.

1.7.4 Cable DeviceNet, 5 Pin Male Connector Strip

Operating device

Next DeviceNet participant



Male connector 5 pin

Female connector 5 pin

Both ends of the shield are connected to pin 3.

Contrary to the recommendations made in the CiA Draft Standard 102, the cable is only equipped with the wires needed to meet the current communication requirements.

1.8 Error Messages

Error messages are displayed on the operating device along with a code and sub-code. Error messages are composed as follows.

Communication Error

Code XXXXX

Subcode XXXXX

Retries XXXXX

Table 1-42 DeviceNet error messages

Code	Subcode	Error Type	Possible Cause
50		Hardware error	
	1	CAN controller error (stuff error)	
	2	CAN controller error (form error)	
	3	CAN controller error (acknowledge error)	Device is not connected to the bus.
	4	CAN controller error (bit 1 Error)	Short-circuit between the CAN_L and CAN_H line.
	5	CAN controller error (bit 0 error)	Short-circuit between the CAN_L and CAN_H line.
	6	Error from CAN controller (CRC error)	
60		Data exchange error	
	1	Toggle bit in the control byte is not processed by the controller or the DeviceNet master.	If the controller detects that the toggle bit in the Produced Data and the toggle bit in the Consumed Data differ, the toggle bit in the Consumed Data must be set to the same value as that of the toggle bit in the Produced Data.
	2	Changed data in the operating device is not read by controller	Although transferred by Poll I/O the controller does not read from the assigned address

1.9 Applications

1.9.1 OMRON DRM 21-V1

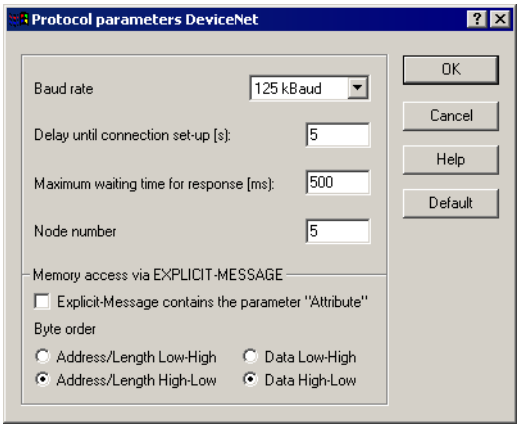


Figure 1-6 DeviceNet for OMRON DRM 21-V1

1.9.2 Rexroth PPC

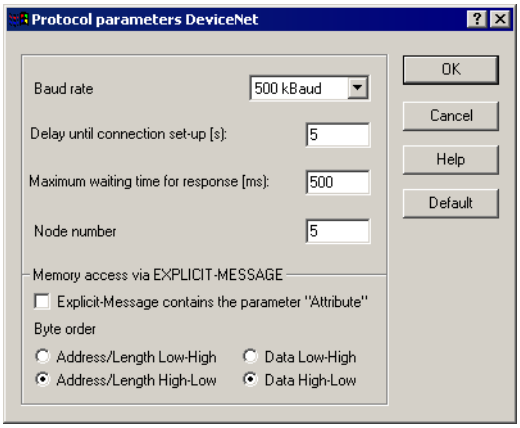


Figure 1-7 Protocol parameters for Rexroth PPC

1.9.3 Rockwell RS Logix 5555 - 1756 DNB

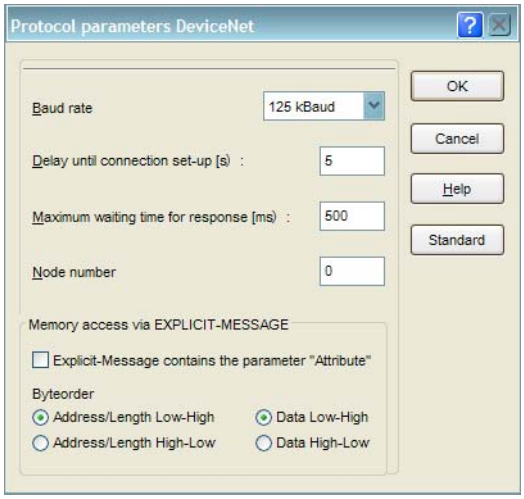


Figure 1-8 DeviceNet for Rockwell RS Logix 5555 - 1756 DNB

1.9.4 Rockwell SLC 505 - 1747 SDN/B

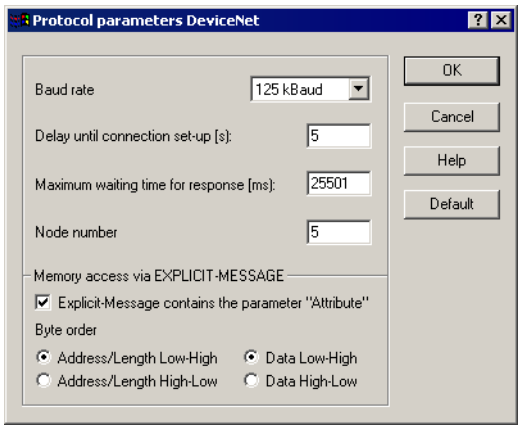


Figure 1-9 DeviceNet for Rockwell SLC 505-1747 SDN/B

A Index

C

Cable
- DeviceNet 5 pin male connector strip 1-22
- DeviceNet 9 pin D-SUB 1-22

D

DeviceNet 1-1
- Explicit Message 1-1
  - Format 1-16
- Module/network status 1-6
- Object definitions 1-10
- Poll I/O connection 1-4

P

Pin assignment
- DeviceNet 1-19, 1-20

Protocol parameters
- DeviceNet 1-6

V

Variables 1-9

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